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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09 737,206	12 14 2000	Henry F. Taylor		1329

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J. Nevin Shaffer, Jr.  
Building One, Suit 360  
1250 Capital of Texas Highway, S.,  
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EXAMINER

KIANNI KAVEH C

ART UNIT PAPER NUMBER

2877

DATE MAILED: 09 06 2002

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

09/737,206

Applicant(s)

TAYLOR ET AL.

Examiner

Kevin C Kianni

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 1 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☐ Claim(s) \_\_\_\_ is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☒ Claim(s) 1-20 are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Notice of References Cited

- 1) ☐ Notice of Draftsperson
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_
- 5) ☐ Other

## DETAILED ACTION

### *Election/Restrictions*

1. Group I, claim(s) 1-14, drawn to an opto-electronic module wherein a plurality of Z-connector arrays, each array being disposed between two adjacent opto-electronic layers and having an arrangement of Z-connector segments, plurality of Z-connector arrays being disposed such that the arrangement of Z-connector segments are aligned to one another to provide a plurality of Z-direction waveguides, at least one Z-direction waveguide comprising a Z-connector segment from each of Z-connector arrays searchable in class 358/14.

II. Group II, claim(s) 15-26, drawn to a first vertical optical coupler disposed on a first one of first layers and located within three-dimensional volume, first vertical optical coupler directing a first light beam from a waveguide of first one of first layers into three-dimensional volume and in a direction perpendicular to the surface of the layer; and a second vertical optical coupler disposed on a second one of first layers and located within three-dimensional volume, second vertical optical coupler receiving a second light beam within the three-dimensional volume and from a direction perpendicular to the surface of the layer, and coupling second light beam into a waveguide of second one of first layers searchable in class 358/129.

III. Group III, claim(s) 27-28, drawn forming a holding unit of a three-dimensional optical module, method comprising the steps of (a) forming a layer of cladding material on a support substrate; (b) forming a layer of core material over the previously formed

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layer of cladding material; (c) patterning the layer of core material to leave segments of core material; (d) forming an additional layer of cladding material over the previously formed segments of core material; (e) polishing the previously formed layer of cladding material; (f) reiterating steps (b)-(e) for one or more times to form a holding unit; and (g) forming one or more gaps in a side of the holding unit searchable in class 358/131.

IV. Group IV, claim(s) 29-31, drawn to a method of forming a holding unit of a three-dimensional optical module, method comprising the steps of forming at least one of a layer or block of photo-refractive material; (b) exposing a surface of layer or block of photo-refractive material to patterned actinic radiation to increase the index of refraction of the portions so exposed; and (c) forming one or more gaps in a side of the layer or block of photo-refractive material searchable in class 358/10.

V. Group V, claim(s) 32-52, drawn to forming an optical module layer with an Z-direction optical device comprising the steps of (a) providing a first substrate having a first surface; (b) forming an adhesive buffer layer on the first surface of the first substrate; (c) attaching a vertical optical device to the buffer layer such that optical device is oriented to convey a light beam perpendicular to the first surface of the first substrate; and (d) coating the first surface of the first substrate and the vertical optical device with one or more polymer layers to form a composite structure, composite structure having a bottom surface attached to the buffer layer and a top surface searchable in class 358/130.

VI. Group VI, claim (s) 53-59, drawn to forming an optical module with one or more layers having a Z-direction optical devices, method comprising the steps of-. providing

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a first plurality of first layers, each first layer having one or more optical waveguides, at least two of first layers each further comprising a vertical optical coupler coupled to a waveguide of the layer; providing one or more second layers, each second layer having at least one of an opto-electronic device and a waveguide; laminating first layers together with a second layer being disposed between two first layers and with photo-refractive material disposed between at least two adjacent first layers searchable in class 358/14.

The inventions are distinct, each from the other because of the following reasons:

2. Inventions I, II, III, IV, V and VI are related as process of making and process of using the product. In this instance groups I, II, III and IV are related in different techniques of process of making and using the product in which in group I, claim(s) 1-14, the process of making the product drawn to an opto-electronic module wherein a plurality of Z-connector arrays, each array being disposed between two adjacent opto-electronic layers and having an arrangement of Z-connector segments, plurality of Z-connector arrays being disposed such that the arrangement of Z-connector segments are aligned to one another to provide a plurality of Z-direction waveguides, at least one Z-direction waveguide comprising a Z-connector segment from each of Z-connector arrays; while in group II, claim(s) 15-26, the process of making the product drawn to a first vertical optical coupler disposed on a first one of first layers and located within three-dimensional volume, first vertical optical coupler directing a first light beam from a waveguide of first one of first layers into three-dimensional volume and in a direction perpendicular to the surface of the layer; and a second vertical optical coupler disposed

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on a second one of first layers and located within three-dimensional volume, second vertical optical coupler receiving a second light beam within the three-dimensional volume and from a direction perpendicular to the surface of the layer, and coupling second light beam into a waveguide of second one of first layers; while in group III, claim(s) 27-28, the process of making the product drawn forming a holding unit of a three-dimensional optical module, method comprising the steps of (a) forming a layer of cladding material on a support substrate; (b) forming a layer of core material over the previously formed layer of cladding material; (c) patterning the layer of core material to leave segments of core material; (d) forming an additional layer of cladding material over the previously formed segments of core material; (e) polishing the previously formed layer of cladding material; (f) reiterating steps (b)-(e) for one or more times to form a holding unit; and (g) forming one or more gaps in a side of the holding unit; while in group IV, claim(s) 29-31, the process of making the product drawn to a method of forming a holding unit of a three-dimensional optical module, method comprising the steps of forming at least one of a layer or block of photo-refractive material; (b) exposing a surface of layer or block of photo-refractive material to patterned actinic radiation to increase the index of refraction of the portions so exposed; and (c) forming one or more gaps in a side of the layer or block of photo-refractive material; In contrast groups V and IV are related to different techniques of product being made in which in group V, claim(s) 32-52, the product made drawn to forming an optical module layer with an Z-direction optical device comprising the steps of (a) providing a first substrate having a first surface: (b) forming an adhesive buffer layer on the first surface of the first

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substrate; (c) attaching a vertical optical device to the buffer layer such that optical device is oriented to convey a light beam perpendicular to the first surface of the first substrate; and (d) coating the first surface of the first substrate and the vertical optical device with one or more polymer layers to form a composite structure, composite structure having a bottom surface attached to the buffer layer and a top surface; while in group VI, claim (s) 53-59, the product made drawn to forming an optical module with one or more layers having a Z-direction optical devices, method comprising the steps of providing a first plurality of first layers, each first layer having one or more optical waveguides, at least two of first layers each further comprising a vertical optical coupler coupled to a waveguide of the layer; providing one or more second layers, each second layer having at least one of an opto-electronic device and a waveguide; laminating first layers together with a second layer being disposed between two first layers and with photo-refractive material disposed between at least two adjacent first layers.

The use as claimed cannot be practiced with a materially different product. Since the product is not allowable, restriction is proper between said method of making and method of using. The product claim will be examined along with the elected invention (MPEP § 806.05(i)).

3. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

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4. Applicant is advised that the reply to this requirement to be complete must include an election of the invention to be examined even though the requirement be traversed (37 CFR 1.143).
5. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).
6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin C Kianni whose telephone number is (703) 308-1216. The examiner can normally be reached on 9:30-18:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Frank Font can be reached on (703) 308-4881. The fax phone numbers for the organization where this application or proceeding is assigned are (703)308-5401 for regular communications and (703) 308-5401 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 305-4770.

  
Kevin C Kianni  
Examiner: Kianni  
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August 26, 2002